

1 ABSTRACT OF THE DISCLOSURE  
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3 The invention provides a method and system for adaptive point to multi-  
4 point wireless communication. The method and system integrate adaptive and dynamic  
5 responsiveness for communication parameters related to multiple characteristics of wire-  
6 less communication links, both for a single sender and a single receiver, and for sets of  
7 multiple senders and multiple receivers. Moreover, the method and system are self-  
8 optimizing in the sense that they are adaptively and dynamically responsive to results of  
9 attempts to optimize parameters related to multiple characteristics of wireless communi-  
10 cation links. Multiple characteristics of wireless communication links are optimized si-  
11 multaneously, in that the optimal set of values for a plurality of N characteristics, rather  
12 than N individual optimal values for each characteristic, is adaptively and dynamically  
13 selected. A wireless PHY layer and a wireless MAC layer collectively include a set of  
14 communication parameters, each of which is adaptively modified by a BSC for commu-  
15 nication with a plurality of CPE. The BSC adjusts communication with each CPE indi-  
16 vidually and adaptively in response to changes in communication characteristics, includ-  
17 ing both changes in communication characteristics between the BSC and each selected  
18 CPE, and changes in communication characteristics induced by concurrent communica-  
19 tion between the BSC and multiple CPE. Particular communication characteristics  
20 adapted for can include physical characteristics, transport characteristics, and application  
21 characteristics. A wireless transport layer includes adaptive and dynamic characteristics  
22 responsive to communication characteristics between the BSC and each selected CPE,

1 and between the BSC and multiple CPE. These communication characteristics are re-  
2 sponsive to each individual communication link so as to optimize communication band-  
3 width between the BSC and each selected CPE. These include (a) BSC control of a  
4 TDMA protocol, preferably TDD; (b) BSC control of frequency reuse for CPE, and (c)  
5 BSC control of spatial separation of LOS, OLOS, or NLOS communication paths with  
6 CPE; each responsive to measured BER and requested communication bandwidth de-  
7 mand. The BSC provides point-to-point and point-to-multipoint wireless communication  
8 services using parameters continuously adaptive to current conditions, each individ-  
9 ualized to one or more selected CPE. The wireless transport layer includes burst mode mes-  
10 sages from the BSC downstream to individual CPE, and similarly includes burst mode  
11 messages from individual CPE upstream to the BSC. This allows the BSC and each indi-  
12 vidual CPE to communicate so as to optimize throughput in a communication direction  
13 (downstream or upstream) for each communication link between the BSC and an individ-  
14 ual CPE.